

Scheme Number: TR010041

6.8 Environmental Statement – Appendix 9.3 Otter and Water Vole Report

Part B

APFP Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009



Infrastructure Planning

Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

The A1 in Northumberland: Morpeth to Ellingham

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Environmental Statement - Appendix

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1. INTRODUCTION

- 1.1.1. The A1 in Northumberland: Alnwick to Ellingham (Part B) aims to increase capacity along an approximately 8 km section of the existing A1 between Alnwick and Ellingham, in Northumberland. Part B includes widening the existing A1 from single carriageway to a dual carriageway. Part B also includes improving the existing junction at Charlton Mires with a new grade-separated junction and a new Heckley Fence Accommodation Overbridge. Part B aims to increase capacity, enhance resilience, improve safety and shorten journey times along the route. Details of the Part B location are provided on the Location Plan of this Environmental Statement (ES) (Application Document Reference: TR010041/APP/2.1).
- 1.1.2. Part B comprises dualling of the existing A1 single carriageway; a new southbound carriageway would be constructed to the east of the existing A1, and the existing A1 would act as a new northbound carriageway. A number of private means of access would need to be stopped up and replaced with new access routes including new roads for East and West Linkhall, and from the B6347 and Rock South Farm. To facilitate the construction of Part B, a length of an extra high voltage cable, utility pipes and telecommunication cables would need to be diverted. Additionally, a construction compound would be constructed within the Lionheart Enterprise Park adjacent to The Applicants Gritting Depot (the Lionheart Enterprise Park Compound both eastern and western sites), and a Main Compound constructed near Thirston. Part B also includes new drainage features, new and extended culverts, temporary and permanent Public Rights of Way (PRoW) diversions, together with new and/or improved ancillary features.
- 1.1.3. This appendix details the methods, results, impact assessment, and recommended mitigation to avoid or reduce adverse impacts upon otter *Lutra lutra* and water vole *Arvicola amphibius* in respect of Part B.
- 1.1.4. Within this document, Part B comprises three elements. The Part B Main Scheme Area refers to the Order Limits north of Alnwick and south of Ellingham only. The Order Limits also includes the Lionheart Enterprise Park Compound (eastern and western sites), located to the south of Alnwick, and the Main Compound, which is located within the A1 in Northumberland: Morpeth to Felton (Part A).

1.1. ECOLOGICAL BACKGROUND

1.1.1. An extended Phase 1 habitat survey was undertaken in 2016 (Ref. 1) identifying watercourses and waterbodies within a survey area extending to 500 m either side of the existing A1 carriageway which encompassed the Part B options under consideration at that time. A desk study accompanied the Phase 1 habitat survey, identifying historic records of protected and/or notable species, including otter and

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water vole. Subsequently, targeted surveys for otter and water vole were completed in 2016 and 2017 (**Ref. 2**).

- 1.1.2. Surveys were completed between 5 and 9 September, and 17 and 19 October 2016 along watercourses with potential to support either species. Surveys extended 250 m upstream and downstream from the existing carriageway. Surveys were subsequently repeated between 30 May and 2 June 2017. The locations of watercourses surveyed are illustrated on Figure 9.5: Otter and Water Vole Survey Locations, Volume 6 of this ES (Application Document Reference: TR010041/APP/6.6).
- 1.1.3. The results of 2016 and 2017 surveys were reported in 2018 (**Ref. 2**), with a recommendation of repeating surveys in the event of development not commencing within twelve months of initial surveys being completed.

1.2. BRIEF AND OBJECTIVES

- 1.2.1. This appendix details the results of an updated desk study, to identify new records of otter and water vole since the original desk study. This appendix additionally details the results of surveys undertaken in 2018 and 2019 to:
 - a. Establish whether otter and water vole are present or likely absent from the Survey Area (up to 250 m upstream and downstream of watercourses crossed or in proximity to the Order Limits); and
 - **b.** If present, evaluate the importance of the Order Limits for otter and water vole and make recommendations as to how proposals should account for otter and water vole with respect to legislation, planning and biodiversity policy.
- 1.2.2. The results of this survey, and subsequent recommendations, are included within this report.

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2. BASELINE IDENTIFICATION METHODOLOGY

2.1. DESK STUDY

- 2.1.1. A desk study was undertaken in 2019, which examined biological records of protected and notable species within 2 km of the Order Limits as provided by the Environmental Records Information Centre for the North East (ERIC NE).
- 2.1.2. The desk study only considered results from within the last ten years (2009-2019), as earlier records may not be relevant to the current ecological baseline.
- 2.1.3. The desk study also reviewed the findings of otter and water vole surveys undertaken in 2016 and 2017, reported in the 2018 *A1 in Northumberland: Water Vole and Otter Survey Report* (**Ref. 2**).

2.2. FIELD SURVEY

- 2.2.1. To establish whether otter or water vole are present or likely to be absent, a survey was completed to search for field signs of both species in accordance with current best practice guidance (**Ref. 3** and **Ref. 4**). Watercourses subject to survey encompassed those surveyed in 2016 and 2017, where access was possible.
- 2.2.2. Surveys were completed within the appropriate season for water vole survey (late April to early October). Surveys for otter can be completed at any time of year and were therefore completed concurrently with the survey for water vole. Surveys incorporated three elements:
 - a. A walked survey of watercourses within the Survey Area,, during which a thorough visual inspection of the banks and riparian habitat was made field signs of either otter or water vole. Field signs of water vole include faeces, latrines, feeding stations, burrows, 'lawns', nests, footprints, and runways in vegetation, whilst field signs of otter include spraints (faeces), feeding remains, holts, hovers/couches and footprints;
 - b. An assessment of habitats present was additionally recorded, with particular habitat features relevant to supporting otter or water vole recorded (for example general habitat type, shore/bank substrate, bordering land use, vegetation presence and density, level of disturbance, bank profile, water depth) to determine suitability for either species; and
 - **c.** Field signs or evidence of other relevant wildlife (for example mink *Neovison vison* or brown rat *Rattus norvegicus*) were also recorded.

SURVEY DATES

2.2.3. The otter and water vole surveys were completed by competent surveyors with extensive survey experience, who have a good understanding of the ecology of otter and water vole and confidence in identifying their field signs.

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- 2.2.4. Surveys were undertaken in 2018 and 2019 on the following dates during appropriate weather conditions (i.e. during fair weather and not directly after periods of heavy rain, or when watercourses were in spate):
 - a. 25 June to 29 June 2018 (all watercourses except B2, B5, B12 and B14);
 - b. 10 September to 11 September 2018 (all watercourses except B2, B5, B12 and B14);
 - c. 23 April 2019 (all watercourses except B14); and
 - d. 23 July 2019 (watercourse B14 only).

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3. ECOLOGICAL IMPACT ASSESSMENT METHODOLOGY

3.1. OVERVIEW

- 3.1.1. This section describes the methodology used to ultimately identify significant effects of impacts on water vole and identify suitable mitigation. The Ecological Impact Assessment (EcIA) adopts guidance from the Chartered Institute of Ecology and Environmental Management (CIEEM) (Ref.5) and the Design Manual for Roads and Bridges (DMRB) Interim Advice Note (IAN) 130/10 'Ecology and Nature Conservation: Criteria for Impact Assessment' (Ref. 6).
- 3.1.2. Ecological receptors have been subject to nature conservation evaluation. The significance of effects has then been assessed taking into account the characterisation of potential impacts (including duration, extent and reversibility) and their consequent effects on important ecological receptors.

3.2. NATURE CONSERVATION EVALUATION

- 3.2.1. Ecosystems, habitats and species are assigned levels of importance for nature conservation based on the criteria detailed within CIEEM guidance (**Ref. 5**), IAN 130/10 (**Ref. 6**) and summarised in **Table 3-1** of this chapter. The rarity, ability to resist or recover from environmental change and uniqueness of an ecological receptor, function/role within an ecosystem and level of legal protection or designation afforded to a given ecological receptor are all factors considered in determining its importance. Consideration has also been given to the importance of the species or habitat and its conservation status at a geographic level taking population size, life cycle, rarity and/or distribution into account.
- 3.2.2. In addition, the importance of an ecological receptor takes into account any statutory or non-statutory designations, the intrinsic importance of the ecological receptor and whether it supports legally protected or notable species.

Table 3-1 - Importance Criteria

Importance	Criteria
International or European	Ecosystems and Habitats - Ecosystems or habitats essential for the maintenance of:
	 Internationally designated areas or undesignated areas that meet the criteria for designation; and/or Viable populations of species of international conservation concern.
	Species:
	Species whose presence contributes to the maintenance of qualifying habitats, communities and assemblages that occur



Importance	Criteria
	 within internationally designated sites or within undesignated areas that meet the criteria for such designation; Resident, or regularly occurring, populations of species that may be considered at an International or European level including those listed on Annexes II, IV and V of the Habitats Directive and Annex I of the Birds Directive, where: The loss of the population would adversely affect the conservation status or distribution of the species at this geographical stage; or The population forms a critical part of a wider population at this scale; or The species is at a critical phase of its life cycle at this scale.
UK or National	Ecosystems and Habitats - Ecosystems or habitats essential for the maintenance of:
	 Qualifying communities and assemblages that occur within nationally designated sites or within undesignated areas that meet the criteria for such designation; and/or Viable populations of species of national conservation concern; Areas of ancient woodland; or Habitats listed for their principal importance for biodiversity (Section 41 of the NERC Act 2006).
	Species - Species whose presence contributes to:
	 The maintenance of qualifying habitats, communities and assemblages that occur within nationally designated sites or within undesignated areas that meet the criteria for such designation; The maintenance and restoration of biodiversity and ecosystems at a national level, as defined in the Natural Environment and Rural Communities (NERC) Act 2006 Section 41 requirements; Resident, or regularly occurring, populations of species that may be considered at an International/European (as detailed above), National or UK level including those receiving legal protection (listed within Schedules 1, 5 and 8 of the WCA) or listed for their principal importance for biodiversity or conservation status, where: The loss of the population would adversely affect the conservation status or distribution of the species at this geographical stage; or The population forms a critical part of a wider population at this scale; or The species is at a critical phase of its life cycle at this scale.



Importance	Criteria			
Regional	Ecosystems and Habitats - Ecosystems or habitats essential for the maintenance of:			
	 Populations of species of conservation concern within the region. 			
	Species:			
	 Species whose presence contributes to the maintenance and restoration of biodiversity and ecosystems within the region; Resident, or regularly occurring, populations of species that may be considered at an International, European, UK or National level (as detailed above), where: 			
	The loss of the population would adversely affect the conservation status or distribution of the species at this geographical stage; or			
	The population forms a critical part of a wider population at			
	this scale; or The species is at a critical phase of its life cycle at this scale.			
	The species is at a official phase of its life syste at this scale.			
County	Ecosystems and Habitats - Ecosystems or habitats essential for the maintenance of:			
	 Populations of species of conservation concern within the authority area. 			
	Species:			
	 Species whose presence contributes to the maintenance and restoration of biodiversity and ecosystems within a relevant area such as Northumberland. 			
	 Resident, or regularly occurring, populations of species that may be considered at an International, European, UK or National level (as detailed above), where: 			
	The loss of the population would adversely affect the conservation status or distribution of the species at this geographical stage; or			
	 The population forms a critical part of a wider population at this scale; or 			
	The species is at a critical phase of its life cycle at this scale.			
Local	Ecosystems and Habitats - Ecosystems or habitats essential for the maintenance of:			
	 Populations of species of conservation concern within the local area (for example a Local Nature Reserve). 			
	Species:			

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Importance	Criteria
	 Species whose presence contributes to the maintenance and restoration of biodiversity and ecosystems at a local level; Resident, or regularly occurring, populations of species that may be considered at an International, European, UK or National level (as detailed above), where: The loss of the population would adversely affect the conservation status or distribution of the species at this geographical stage; or The population forms a critical part of a wider population at this scale; or The species is at a critical phase of its life cycle at this scale.
Less than Local	Ecosystems or habitats that do not meet the above criteria, i.e., supporting at least populations of species of conservation concern within the local area

3.3. IMPACT ASSESSMENT

CHARACTERISATION OF POTENTIAL IMPACTS

- 3.3.1. CIEEM (Ref. 5) notes that impacts that are likely to be relevant in an assessment are those that are predicted to lead to significant effects (adverse or beneficial) on important ecological receptors. Significant effects are those that undermine the conservation status¹ of important ecological receptors. Knowledge and assessment of construction methods and operational activities, together with the ecological knowledge of ecologists with experience of similar large-scale infrastructure schemes, has been used to identify the potential impacts of the project on ecological receptors.
- 3.3.2. Habitats and species that are considered to have a nature conservation importance of less than local are not considered important ecological receptors² in the context of this assessment. Any impact on such a feature as a result of Part B is considered unlikely to have a significant effect on the conservation status of such habitats or

¹ Conservation status for habitats is determined by the sum of the influences acting on the habitat and its typical species that may affect its long-term distribution, structure and function as well as the long-term distribution and abundance of its population within a given geographical area. Conservation status for species is determined by the sum of influences acting on the species concerned that may affect the long-term distribution and abundance of its population within a given geographical area.

² An ecological receptor is considered important based on many factors including its rarity, diversity, naturalness, context in the wider landscape, size and distribution as set out in A Nature Conservation Review (Ratcliffe, 1977).

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species on a local, regional, national or international scale. Therefore, features assessed to be of less than local nature conservation importance have been scoped out of the EcIA.

3.3.3. Characterisation of potential impacts has considered the processes that could lead to effects on ecological receptors, using the range of standard parameters from IAN 130/10, as well as others deemed appropriate (informed by CIEEM's Guidelines). These included whether the impact was positive (beneficial) or negative (adverse), the probability of the impact occurring (certain, probable, unlikely), its complexity (direct, indirect, cumulative), extent, size, duration, reversibility and timing/duration.

SIGNIFICANCE OF EFFECTS

- 3.3.4. Having characterised importance and potential impacts, proposals for mitigation and compensation have been considered, with the aim of avoiding, preventing, reducing or, if possible, offsetting any identified significant adverse effects. After the application of mitigation proposals, where significant effects are likely to occur, the overall significance of the effect has been assessed.
- 3.3.5. IAN 130/10 does not prescribe a method for determining the significance of ecological effects but does propose significant effect categories which are aligned with other topic areas in the DMRB. These are Neutral, Slight, Moderate, Large or Very Large (Table 3 of IAN 130/10) and are reproduced in Table 3-2 below.
- 3.3.6. In all instances, when determining the level of significance of the ecological effect, Table 3-2 has been used as a guide in association with professional judgement (this is consistent with guidance in IAN 130/10). For example, an effect on an ecological receptor of county level importance could be considered Large if a particularly high proportion of the county resource were to be affected. To determine whether an effect is significant or not, CIEEM's Guidelines will also be considered (in lieu of comparable guidance in the DMRB).

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Table 3-2 - Significance Categories of Effects on Ecological Receptors

Significance Category	Typical Descriptors of Effect (Nature Conservation)
Very Large	An impact on one or more receptor(s) of International, European, UK or National importance.
Large	An impact on one or more receptor(s) of Regional importance.
Moderate	An impact on one or more receptor(s) of County or Unitary Authority Area importance.
Slight	An impact on one or more receptor(s) of Local importance.
Neutral	No significant impacts on key nature conservation receptors.

3.4. MITIGATION

- 3.4.1. The principles of the mitigation hierarchy have been applied when considering potential impacts and subsequent effects on ecological receptors through the following sequential actions:
 - a. Avoidance;
 - **b.** Mitigation;
 - c. Compensation; and
 - **d.** Enhancement.
- 3.4.2. For the purpose of this assessment, mitigation refers to measures that are considered essential to avoid and reduce adverse impacts of Part B. Compensation refers to measures taken to offset the loss of, or permanent damage to, biological resources through the provision of replacement areas.
- 3.4.3. The mitigation measures described within this EcIA have been incorporated into the design and construction programme and taken into account in the assessment of residual effects. The mitigation prescribed aims to avoid or negate impacts on ecological receptors in accordance with best practice guidance and UK, English and local government environmental impact, planning and sustainability policies. These mitigation measures include those required to achieve the minimum standard of established good practice together with additional measures to further reduce any adverse impacts of Part B. The mitigation measures include those required to reduce or avoid the risk of committing legal offences.
- 3.4.4. Mitigation measures set out in this ES are captured in the **Outline Construction**Environmental Management Plan (Outline CEMP) (Application Document
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implementation by the main contractor. The Outline CEMP shall be used to inform a CEMP produced by the main contractor.

3.4.5. Impacts that are not significant (including those where compliance with regulation is required) would be expected to be avoided or reduced through the application of measures detailed within an Outline CEMP (Application Document Reference: TR010041/APP/7.3), including best working practice (e.g. mitigation of potential pollution impacts through adherence to standard best practice and guidelines). Significant ecological impacts are expected to be mitigated through a combination of best practice and typical, proven mitigation methods along with mitigation targeted to specific locations as described in this assessment.

3.5. LIMITATIONS AND DEVIATIONS

- 3.5.1. The updated otter and water vole surveys aimed to cover watercourse habitats within 250 m of the Order Limits. However, it was not possible to access all watercourses, with access not granted for:
 - **a.** An un-named watercourse between Middlemoor Farmhouse and North Charlton at the north of Part B; and
 - **b.** An un-named watercourse at the south-east of Part B between Broxfield Farm and Moorhouse.
 - c. Access was not originally granted in 2018 to land around an un-named ditch at Charlton Mires, an un-named ditch south east of Heckley House, and an unnamed ditch east of Heckley House. These three watercourses were therefore surveyed separately on 23 April 2019.
- 3.5.2. Restricted/obstructed access to certain watercourses for surveying isn't considered to have negatively impacted the results or conclusions of this assessment; given the historic survey data and historic records held for the area, and in cognisance of a lack of evidence recorded across the wider watercourse resource surveyed within the Survey Area.
- 3.5.3. Cawledge Burn, to the south-east of the Lionheart Enterprise Park Compound (eastern and western sites), was surveyed. However, a small section of this watercourse was inaccessible due to overgrown vegetation. This is not considered to have negatively impacted the results or conclusions of this assessment, owing to the successful survey of the remainder of the watercourse.
- 3.5.4. Some sections of watercourse were overgrown with dense bramble and other scrub, thereby precluding access from these sections and preventing direct assessment of these areas for the presence/signs of otter and water vole. This is not considered to have negatively impacted the results or conclusions of this assessment as there was a complete absence of signs of otter and water vole across the lengths of all watercourses surveyed.

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3.5.5. Third party data and records have been incorporated into this assessment alongside field survey results to ascertain potential impacts to otter and water vole and requirements for mitigation. An absence of records for a given area does not preclude absence of a species and may indicate a paucity in records or inadequate survey effort. The inclusion of historic records and data has been used to influence requirements for field survey. As historic records and data have been assessed alongside physical field survey results; the use of such data is not considered to have negatively impacted the results or conclusions of this assessment.

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4. RESULTS

4.1. DESK STUDY

WATER VOLE

- 4.1.1. The 2019 desk study result returned a single record of water vole within the 2 km search area:
 - a. A single record was provided for a small watercourse located in proximity to Rock Hall, off The Avenue, Rock, Northumberland at Grid Reference NU 20065 20204, 2 km east of the Order Limits.
- 4.1.2. Surveys undertaken in 2016 (**Ref. 2**) purported to have recorded potential water vole field signs in five watercourses:
 - a. B1; Shipperton Burn; burrows and prints recorded;
 - d. B2; un-named ditch at Charlton Mires; burrows and prints recorded;
 - e. B4; un-named ditch within Kiln Plantation Farm; burrows and prints recorded;
 - f. B8; Denwick Burn; burrows recorded; and
 - **g.** B9; White House Burn; latrines/droppings, burrows, prints and runs/paths recorded.
- 4.1.3. Field signs of mink (in the form of scats) were also recorded along the banks of the Shipperton Burn during 2016 surveys, indicating presence and activity of this species in the area. Presence of mink is a significant factor reducing the likelihood of water vole occurring (**Ref. 7** and **8**).
- 4.1.4. Further surveys undertaken in 2017 (**Ref. 2**) found no definitive field signs of water vole along any of the thirteen surveyed watercourses.

OTTER

- 4.1.5. The 2019 desk study returned 13 records of otter within the 2 km search area. Two of these records were located adjacent to the boundary of the north east of Part B, with the closest record, dating from 2012, located 15 m from the Order Limits. The most recent of the 13 records returned was from 2015, where an otter was observed at Lime Kilns at the Rock Midstead Site (80 m to the east of the Order Limits).
- 4.1.6. Surveys undertaken during 2016 and 2017 failed to identify any field signs of otter or evidence of their presence/activity.

4.2. FIELD SURVEY

Table 4-1 presents the results watercourses surveyed in 2018 and 2019, with results displayed on **Figure 9.5**: Otter and Water Vole Survey Locations, Volume 6 of this ES (Application Document Reference: TR010041/APP/6.6).



Table 4-1 – Survey Results of Watercourses Surveyed in 2018 and 2019

Watercourse	Habitat Context	Water Vole Evidence	Otter Evidence	Suitability Assessment
B1 - Shipperton Burn	This watercourse flows to the east and west of the A1 via a culvert. Both sides of the watercourse were surveyed in 2018. The western section of the burn, immediately adjacent to the A1, comprises woodland which shades the watercourse. Further west, the watercourse runs through arable fields, with the dominant bankside vegetation consisting of bramble and nettles. The section immediately to the east of the A1 is covered by dense woodland. Further west, though, only the northern bank is wooded, with sheep-grazed acid grassland to the south of the burn.	No evidence or field signs recorded	No evidence or field signs recorded	The western section of the burn immediately adjacent to the A1 is of low suitability, however the section running through arable fields is assessed as providing good suitability to support either species. The section immediately east of the A1 is of low suitability. The south bank provides more suitable habitat by virtue of the less shaded bank and the species present, holding potential to support either species.
B2 - Un-named ditch at Charlton Mires	This watercourse is dry along most of its length. There are very shallow, muddy pools remaining towards the western end of the watercourse, near Rock Lodge and at the northernmost extent of the watercourse, just south of the B6347. Most of the channel is vegetated with terrestrial plant species including broad-leaved dock <i>Rumex obtusifolius</i> , perennial rye-grass <i>Lolium perenne</i> , creeping buttercup <i>Ranunculus repens</i> and common nettle <i>Urtica dioica</i> , indicating that it has been dry for a long period. The only aquatic/semi-aquatic species present is a small amount of reed canary-grass <i>Phalaris arundinacea</i> and brooklime <i>Veronica beccabunga</i> along the ditch section to the west of the A1 and B6347. Sections of this watercourse are also heavily choked with bramble <i>Rubus fruticosus</i> agg. and hawthorn <i>Crataegus monogyna</i> scrub, particularly at the western and northern ends and throughout the small section of ditch running between the A1 and the B6347.	Water vole field signs were found along this watercourse in 2016. No evidence or field signs recorded during 2018/2019 surveys.	No evidence or field signs recorded	Unsuitable to support either species, aside from commuting individuals.
B3 - Un-named ditch at Craggy Wood	This long section of watercourse flows east and west of the A1. The western section between the A1 and the location of a pond is very overgrown with brambles and other scrub. The water level was very low at the time of the survey (less than 5cm) and small pools had formed with bare mud between them. To the west of the pond the channel was completely dry and appeared to have been dry for a considerable length of time, evidenced by mature sycamore trees growing in the channel. To the east of the A1 the northern section was completely dry. Further south, the channel was heavily shaded by a hawthorn hedge, with further dry sections and only shallow pools (2-3cm deep) between them.	No evidence found	No evidence or field signs recorded	Low habitat suitability to support species.



Watercourse	Habitat Context	Water Vole Evidence	Otter Evidence	Suitability Assessment
B4 - Un-named ditch within Kiln Plantation Farm	This watercourse flows along the northern edge of mixed plantation woodland, with arable fields to the north of the burn. In 2018 the watercourse was described as having low water levels and thick mud substrate. The banks to the north of the burn provide suitable burrowing substrate with abundant vegetation coverage. The banks to the south, however, are heavily shaded and very sparsely vegetated.	Water vole field signs were found 2016. No evidence or field signs recorded during 2018/2019 surveys.	No evidence or field signs recorded	North banks - good suitability to support water vole. Limited suitability to support otter. South banks - low suitability to support either species.
B5 - Un-named ditch south-east of Heckley House	This watercourse comprises a very short length (c.50m) of ditch running north to south parallel with the A1, with the southern end finishing near a hedgerow running west from the A1. The southern section is completely dry and appears to have been so for a long time, evidenced by the terrestrial plant species (creeping buttercup, common nettle, broad-leaved dock, red campion <i>Silene dioica</i> and hogweed <i>Heracleum spp</i>) growing along the channel. There is a small pool of water (approximately 1m x 2m) at the northern end.	No evidence found.	No evidence or field signs recorded	Low suitability to support either species.
B6 - Un-named ditch at Heckley Fence Farm	This short section of watercourse, with arable land to the north and south, runs to the west of the A1. It has steep banks with dense vegetation, dominated by great willowherb <i>Epilobium hirsutum</i> and nettles. Water level was very low, with the eastern third of the ditch being dry at the time of the survey.	No evidence found	No evidence or field signs recorded	Water vole and otter suitability is low due to the ditch being partially dry.
B7 - Un-named ditch west of Whinney Plantation.	This watercourse runs along the western edge of a block of plantation woodland, with improved grassland further west. It is very shaded and overgrown with trees, some of which have fallen across the watercourse. There is an area of gorse <i>Ulex europeaus</i> and willow <i>Salix spp</i> scrub towards the south and where it is less shaded the banks are dominated by nettles and ferns. It has very slow running and shallow water (10cm within deeper pool areas).	No evidence found	No evidence or field signs recorded	Low suitability to support either species.
B8 - Denwick Burn	A very long watercourse which runs alongside the eastern side of the A1 for most of its length. The southern section runs through arable fields with occasional small trees along the banks but with some sections treeless. The watercourse is between 10-40 cm deep, with steep sides and fish were seen to be present. The treeless sections had banks dominated by nettles and willowherb species. The middle section flows along the eastern edge of a small block of woodland, with arable fields along its eastern bank. It then continues through arable fields, with scattered small trees along its length and steep, densely vegetated banks. The channel is approximately 1 m wide and 20 cm deep with a slow flow at the time of the survey.	Burrows found near the southern end of the burn in 2016. No evidence or field signs recorded during 2018/2019 surveys.	No evidence or field signs recorded	Denwick Burn (at Broxfield Farm) possesses the most suitable habitat to support water vole. Limited opportunities to support resident otter.



Watercourse	Habitat Context	Water Vole Evidence	Otter Evidence	Suitability Assessment
	The northern section of Denwick Burn (at Broxfield Farm) consists of a channel approximately 1 m wide and less than 10 cm deep, with a slow flow rate and abundant submerged and emergent plants including floating sweet grass <i>Glyceria fluitans</i> , brooklime and water-cress <i>Nasturtium officinale</i> . The banks of this section, however, are heavily poached by cattle which are kept in the field. A short section of Denwick Burn continues to the west of the A1. This section flows through a small wooded area with dense vegetation along the banks and within the channel dominated by soft rush <i>Juncus effusus</i> and meadowsweet <i>Filipendula ulmaria</i> . The water is very shallow and the channel is dry in some sections.			
B9 - White House Burn at Heiferlaw Bridge.	The length of White House Burn surveyed runs to the west of the A1, up to the B6341 and to the east of the A1. The western section nearest to the A1 runs through improved grassland, before continuing to the south of a small stand of woodland, with arable land to the south of the watercourse. The channel is 1.5 m wide and has steep earth banks with vegetation including ferns, bramble, common nettle, wood avens <i>Geum urbanum</i> , herb-Robert <i>Geranium robertianum</i> and wavy hair-grass <i>Deschampsia flexuosa</i> . The eastern section of the watercourse is heavily shaded from mature trees and extensive dry sections within the channel.	Evidence of water voles, including latrines/droppings, burrows, prints and runs/paths was found along the western section of this watercourse in 2016. No evidence or field signs recorded during 2018/2019 surveys.	No evidence or field signs recorded	Western section – moderate suitability to support either species. Eastern section – low suitability to support either species.
B10 - Un-named ditch at Heiferlaw Bank.	This ditch was completely dry at the time of the survey and appeared to have been dry for a considerable amount of time, evidenced by the terrestrial vegetation growing in the channel.	No evidence found	No evidence or field signs recorded	Unsuitable to support either species.
B11 - Un-named ditch feeding into Denwick Burn.	This watercourse forms the boundary between arable fields to the west of the A1, with a hawthorn hedge along its southern bank. The western half contains shallow water (less than 5 cm deep), whilst the eastern half comprises shallow pools (less than 10 cm deep) with partial connectivity. The steep banks are heavily vegetated, with dominant nettles and abundant hogweed.	No evidence found	No evidence or field signs recorded	Low suitability to support either species.
B12 - Un-named ditch east of Heckley House.	This is a short section of watercourse running approximately 120 m west from the A1, between two arable fields. There are several mature trees and scrub along the northern bank but the southern bank is mostly covered in grasses and herbaceous species including common nettle, hogweed, red campion, broad-leaved dock, cleavers <i>Galium aparine</i> , reed canarygrass, male fern <i>Dryopteris filix-mas</i> , herb-Robert, soft rush, hedge woundwort <i>Stachys sylvatica</i> , great willowherb and	No evidence found	No evidence or field signs recorded	Unsuitable for either species owing to the clearance of the ditch.



Watercourse	Habitat Context	Water Vole Evidence	Otter Evidence	Suitability Assessment
	meadowsweet. Consequently, the ditch is not heavily shaded along most of its length and there are patches of brooklime, great willowherb and floating sweet-grass within the steep-sided channel. The watercourse is approximately 1 m wide and 10-20 cm deep. At the far eastern end of the watercourse, just before it is culverted beneath the A1, the ditch has been recently cleared out and the sides re-profiled and mostly consisting of bare earth, with no vegetation growing within the channel at this point.			
B13 - Un-named ditch feeding into White House Burn.	This watercourse is heavily shaded from elder and birch growing along the sides of the burn.	No evidence found	No evidence or field signs recorded	Low suitability to support either species.
B14 - Cawledge Burn, east of Lionheart Enterprise Park.	This watercourse runs through mixed broadleaved and coniferous woodland. Broadleaved species mainly comprise beech and sycamore with bankside vegetation comprising bramble, cleavers and bracken with few grass species. The banks consist primarily of rock; however, some sections of earth bank are present on the northern bank of the watercourse. The watercourse is approximately 5 m wide and ranges between around 0.5 m and 5 cm deep.	No evidence found	No evidence or field signs recorded	Low suitability to support either species.

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- 4.2.1. No evidence of otter was recorded during field surveys undertaken between 2016 and 2019. No definitive water vole field signs were recorded during the 2016 or 2017 surveys and no field signs were recorded in 2018 and 2019. Furthermore, mink were recorded along the Shipperton Burn. Overall, both species are concluded to be likely absent from the Survey Area (including watercourses within proximity to both the Lionheart Enterprise Park Compound both eastern and western sites and Main Compound).
- 4.2.2. Although no signs of otter or water vole were recorded, the following small mammal field signs were documented:
 - **a.** Shipperton Burn Field vole *Microtus agrestis* feeding remains and latrine recorded.
 - **b.** Un-named ditch within Kiln Plantation Farm Disused small mammal burrows recorded.
 - **c.** White House Burn at Heiferlaw Bridge Rat droppings and rat burrows, mink prints and spraints and possible field vole burrows were recorded west of the A1.
 - **d.** Un-named ditch feeding into Denwick Burn Burrows recorded along the length of the watercourse likely utilised by rat or field vole.
 - e. Un-named ditch east of Heckley House Field vole droppings were recorded beneath the hollow of a rotten tree stump; and
 - f. Un-named ditch feeding into White House Burn Small mammal prints were recorded, although not consistent with water vole.

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5. NATURE CONSERVATION EVALUATION

- 5.1.1. No evidence of otter or water vole was recorded during surveys in 2018 and 2019, despite the presence of habitat with the potential to support either species within the Order Limits.
- 5.1.2. Taking into consideration the results of potential (but unconfirmed) water vole field signs recorded during the 2016 surveys in the context of the presence of mink (as confirmed through scat presence), water vole are considered likely absent from within the Order Limits and Survey Area.
- 5.1.3. Whilst habitat with potential to support otter exists within the Order Limits, and their historic presence confirmed within the wider landscape, owing to the absence of activity or evidence of otter during surveys they are considered likely absent from within the Order Limits and Survey Area. In cognisance of the above, both species are considered to be of less than local importance.

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6. POTENTIAL IMPACTS

6.1.1. No potential impacts as a result of construction and operation of Part B are anticipated as otter and water vole are concluded to be absent from the Survey Area.

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7. MITIGATION

- 7.1.1. Despite no evidence of otter or water vole being recorded during the most recent surveys of watercourses within 250 m of Part B, surveys undertaken in 2016 indicated that water vole were present at five locations at that time (**Ref. 2**).
- 7.1.2. Otter and water vole are mobile species which could potentially recolonise areas within the Order Limits in future. It is therefore recommended that a pre-construction survey of all watercourses that may be directly affected by construction of Part B is undertaken. This would include searches extending to 250 m either side of proposed crossing points or construction locations, prior to commencement of construction works.
- 7.1.3. Should any evidence of otter or water vole be recorded during pre-construction surveys, dependent on the evidence recorded, consideration of an application for derogation licensing from Natural England may be required. Licensing may be required to facilitate construction and would ensure specific mitigation measures are enforced and adhered to throughout the construction period.
- 7.1.4. All works personnel would be advised through toolbox talks of the procedures to follow in the unlikely event that otter or water vole, their burrows or other evidence of presence/activity, is encountered. If otter or water vole or their active burrows are discovered, works would cease immediately within the vicinity and the advice of an ecological clerk of works or suitably experienced ecologist obtained. Thereafter, it may be necessary to apply for a derogation licence to Natural England and install appropriate mitigation measures to facilitate construction of Part B in that area.

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8. **RESIDUAL IMPACTS**

- 8.1.1. There are currently no residual impacts anticipated as otter and water vole are concluded to be absent from the Survey Area.
- 8.1.2. In the event otter or water vole are recorded during pre-construction surveys, the impact of Part B, during both construction and operation, should be assessed. Following assessment, appropriate mitigation measures to avoid or reduce any predicted residual effects would be implemented and monitored and may require consultation with Natural England.

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9. CONCLUSIONS

- 9.1.1. Otter and water vole surveys undertaken within 250 m of the Order Limits concluded that otter and water vole are likely absent from watercourses that may be affected by construction and operation of Part B. Surveys undertaken in 2016 indicated that water vole were present at five locations: Shipperton Burn, un-named ditch at Charlton Mires, un-named ditch within Kiln, Denwick Burn and White House Burn at Heiferlaw Bank. However, no evidence of the continued presence of this species was found in surveys undertaken in 2017, 2018 or 2019. It is concluded that Part B would have no impacts on otter or water vole and therefore specific mitigation for these species is not required.
- 9.1.2. Pre-construction surveys of watercourse crossing points/construction activities within watercourses or adjacent riparian habitat are recommended, given the possibility of re-colonisation by otter or water vole in the future.

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- **Ref. 5** Chartered Institute of Ecology and Environmental Management (CIEEM) (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester.
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